

WHAT IS CLAIMED IS:

1. An image processing device which adjusts white balance by adjusting a gain of input color image data, comprising:

5 a white-balance adjusting unit which executes a white-balance adjusting process by adjusting gains of at least image data of two colors of the color image data;

10 a white-detection unit which, from the color image data that have been subjected to the white-balance adjusting process, detects pixels that are located within a range of a presettable white-detection parameter, and accumulates the image data of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

15 a white-detection parameter setting unit which calculates a white-detection parameter that sets the narrowest area with the highest luminance under a condition that the accumulated value of each color is not reduced to "0", and sets the resulting parameter in the white-detection unit; and

20 a white-balance control unit which, based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the condition that the accumulated value of each color is not reduced to "0" has
25 been preset in the white-detection unit, calculates gain

values of at least two colors of the gain-adjusting unit so as to feed-back control the gain-adjusting unit by setting the resulting values in the gain-adjusting unit.

5 2. The image processing device according to claim 1, wherein said white-detection parameter setting unit sets a luminance detection region of the white-detection parameter at the narrowest area with the highest luminance during the initial setting time, and in the case when the
10 accumulated value of each color is "0", allows the luminance detection area of the white-detection parameter to shift toward the low luminance side with a predetermined width so that the white-detection unit is feed-back controlled so as to detect the pixel having the highest luminance within
15 the screen.

3. The image processing device according to claim 2, wherein, in the case when, upon allowing the luminance detection region of the white-detection parameter to shift
20 toward the low luminance side, the accumulated value of each color becomes no longer "0" or the luminance detection region of the white-detection parameter has reached the lowest value, said white-detection parameter setting unit resets the white-detection parameter to the parameter at the time of
25 initial setting.

4. A method of adjusting white-balance by adjusting a gain of input color image data, the method comprising the steps of:

adjusting white-balance adjusting gains of at least
5 image data of two colors of the color image data;

from the color image data that have been subjected to the white-balance adjusting process, detecting pixels that are located within a range of a presettable white-detection parameter, and accumulating the image data
10 of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition that the accumulated value of each color is not reduced to
15 "0", and setting the resulting parameter; and

based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the condition that the accumulated value of each color is not
20 reduced to "0" has been set, calculating gain values of at least two colors and setting the resulting values so as to carry out a feed-back control process.

5. A method of adjusting white-balance by adjusting a gain of input color image data, the method comprising the steps of:

at the time of initial setting, setting a parameter
5 of a luminance detection region of a white-detection parameter to a narrow area corresponding to the highest luminance;

executing a white-balance adjusting process by
adjusting gains of at least image data of two colors of the
10 color image data;

from the color image data that have been subjected
to the white-balance adjusting process, detecting pixels
that are located within a range of a presettable
white-detection parameter, and accumulating the image data
15 of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the
narrowest area with the highest luminance under a condition
that the accumulated value of each color is not reduced to
20 "0", and setting the resulting parameter;

based upon the accumulated value for each of the colors
in the case when the white-detection parameter that sets
the narrowest area with the highest luminance under the
condition that the accumulated value of each color is not
25 reduced to "0" has been set, calculating gain values of at

least two colors and setting the resulting values so as to carry out a feed-back control process; and

in the case when the accumulated value of each color is "0", allowing the luminance detection area of the white-detection parameter to shift toward the low luminance side with a predetermined width.

6. A method of adjusting white-balance by adjusting a gain of input color image data, the method comprising the steps of:

at the time of initial setting, setting a parameter of a luminance detection region of a white-detection parameter to a narrow area corresponding to the highest luminance;

executing a white-balance adjusting process by adjusting gains of at least image data of two colors of the color image data;

from the color image data that have been subjected to the white-balance adjusting process, detecting pixels that are located within a range of a presettable white-detection parameter, and accumulating the image data of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition

that the accumulated value of each color is not reduced to "0", and setting the resulting parameter;

based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at least two colors and setting the resulting values so as to carry out a feed-back control process;

10 in the case when the accumulated value of each color
is "0", allowing the luminance detection area of the
white-detection parameter to shift toward the low luminance
side with a predetermined width; and

in the case when the accumulated value of each color becomes no longer "0" or the luminance detection region of the white-detection parameter has reached the lowest value, resetting the white-detection parameter to the parameter at the time of initial setting.

20 7. A computer readable medium for storing instructions,
which when executed on a computer, causes the computer to
perform the steps of:

adjusting white-balance adjusting gains of at least
image data of two colors of the color image data;

25 from the color image data that have been subjected

to the white-balance adjusting process, detecting pixels that are located within a range of a presettable white-detection parameter, and accumulating the image data of the pixels of each color that have been detected so as
5 to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition that the accumulated value of each color is not reduced to "0", and setting the resulting parameter; and

10 based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at
15 least two colors and setting the resulting values so as to carry out a feed-back control process.

8. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to
20 perform the steps of: at the time of initial setting, setting a parameter of a luminance detection region of a white-detection parameter to a narrow area corresponding to the highest luminance;

executing a white-balance adjusting process by
25 adjusting gains of at least image data of two colors of the

color image data;

from the color image data that have been subjected to the white-balance adjusting process, detecting pixels that are located within a range of a presettable
5 white-detection parameter, and accumulating the image data of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition
10 that the accumulated value of each color is not reduced to "0", and setting the resulting parameter;

based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the
15 condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at least two colors and setting the resulting values so as to carry out a feed-back control process;

in the case when the accumulated value of each color
20 is "0", allowing the luminance detection area of the white-detection parameter to shift toward the low luminance side with a predetermined width; and

in the case when the accumulated value of each color becomes no longer "0" or the luminance detection region of
25 the white-detection parameter has reached the lowest value,

resetting the white-detection parameter to the parameter
at the time of initial setting.

9. A computer readable medium for storing instructions,
5 which when executed on a computer, causes the computer to
perform the steps of:

at the time of initial setting, setting a parameter
of a luminance detection region of a white-detection
parameter to a narrow area corresponding to the highest
10 luminance;

executing a white-balance adjusting process by
adjusting gains of at least image data of two colors of the
color image data;

from the color image data that have been subjected
15 to the white-balance adjusting process, detecting pixels
that are located within a range of a presettable
white-detection parameter, and accumulating the image data
of the pixels of each color that have been detected so as
to output the resulting accumulated value for each color;

20 calculating a white-detection parameter that sets the
narrowest area with the highest luminance under a condition
that the accumulated value of each color is not reduced to
"0", and setting the resulting parameter;

based upon the accumulated value for each of the colors
25 in the case when the white-detection parameter that sets

the narrowest area with the highest luminance under the condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at least two colors and setting the resulting values so as to carry out a feed-back control process;

in the case when the accumulated value of each color is "0", allowing the luminance detection area of the white-detection parameter to shift toward the low luminance side with a predetermined width; and

in the case when the accumulated value of each color becomes no longer "0" or the luminance detection region of the white-detection parameter has reached the lowest value, resetting the white-detection parameter to the parameter at the time of initial setting.

10. A computer program for causing the computer to perform the steps of:

adjusting white-balance adjusting gains of at least image data of two colors of the color image data;

from the color image data that have been subjected to the white-balance adjusting process, detecting pixels that are located within a range of a presettable white-detection parameter, and accumulating the image data of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition that the accumulated value of each color is not reduced to "0", and setting the resulting parameter; and

5 based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at
10 least two colors and setting the resulting values so as to carry out a feed-back control process.

11. A computer program for causing the computer to perform the steps of:

15 at the time of initial setting, setting a parameter of a luminance detection region of a white-detection parameter to a narrow area corresponding to the highest luminance;

 executing a white-balance adjusting process by
20 adjusting gains of at least image data of two colors of the color image data;

 from the color image data that have been subjected to the white-balance adjusting process, detecting pixels that are located within a range of a presettable
25 white-detection parameter, and accumulating the image data

of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition
5 that the accumulated value of each color is not reduced to "0", and setting the resulting parameter;

based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the
10 condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at least two colors and setting the resulting values so as to carry out a feed-back control process;

in the case when the accumulated value of each color
15 is "0", allowing the luminance detection area of the white-detection parameter to shift toward the low luminance side with a predetermined width; and

in the case when the accumulated value of each color becomes no longer "0" or the luminance detection region of
20 the white-detection parameter has reached the lowest value, resetting the white-detection parameter to the parameter at the time of initial setting.

12. A computer program for causing the computer to perform the steps of:

at the time of initial setting, setting a parameter of a luminance detection region of a white-detection parameter to a narrow area corresponding to the highest luminance;

executing a white-balance adjusting process by adjusting gains of at least image data of two colors of the color image data;

10 from the color image data that have been subjected to the white-balance adjusting process, detecting pixels that are located within a range of a presettable white-detection parameter, and accumulating the image data of the pixels of each color that have been detected so as to output the resulting accumulated value for each color;

calculating a white-detection parameter that sets the narrowest area with the highest luminance under a condition that the accumulated value of each color is not reduced to "0", and setting the resulting parameter;

20 based upon the accumulated value for each of the colors in the case when the white-detection parameter that sets the narrowest area with the highest luminance under the condition that the accumulated value of each color is not reduced to "0" has been set, calculating gain values of at least two colors and setting the resulting values so as to

